CLAIMS

What is claimed is:

1. A circuit comprising:

a differential amplifier; and

a direct current (DC) source coupled with the differential amplifier, wherein a direct current generated by the DC source is communicated in substantially predetermined portions to plural inverting input terminals of the fully-differential amplifier so as to shift a common-mode voltage of one or more electrical signals processed by the fully-differential amplifier by a substantially predetermined amount.

2. The circuit of claim 1, wherein the differential amplifier comprises:

a first operational amplifier having a first inverting input terminal of the plural inverting input terminals, a first non-inverting input terminal and a first output terminal, wherein the first output terminal is coupled with the first inverting input terminal via a first resistor of a first resistance value;

a second operational amplifier having a second inverting input terminal of the plural inverting input terminals, a second non-inverting input terminal and a second output terminal, wherein the second output terminal is coupled with the second inverting input terminal via a second resistor of substantially the first resistance value, wherein the first and second inverting inputs are further coupled via a third resistor and a fourth resistor coupled in series, the third and fourth resistors both being of a substantially same second resistance value.

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3. The circuit of claim 2, wherein an output terminal of the DC source is coupled with the differential amplifier between the third and fourth resistors.

4. The circuit of claim 1, wherein the DC source generates a substantially fixed current over a predetermined temperature range.

5. The circuit of claim 1, wherein the DC source comprises a plurality of selectable DC sources coupled in parallel with the differential amplifier.

6. The circuit of claim 5, wherein the plurality of DC sources comprises a plurality of DC sources that generate approximately equivalent direct currents.

7. The circuit of claim 5, wherein the plurality of DC sources comprises a plurality of DC sources that generate weighted direct currents.

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8. The circuit of claim 1, wherein the DC source comprises:

a band-gap voltage source;

an operational amplifier having a non-inverting input terminal coupled with the voltage source;

a substantially temperature independent precision resistor coupled with an inverting input terminal of the operational amplifier and an electrical ground;

a transconducting device coupled with an output terminal of the operational amplifier and the precision resistor; and

a current mirror circuit coupled with the transconducting device, wherein an output terminal of the current mirror circuit is coupled with the differential amplifier.

9. The circuit of claim 1, wherein the electrical signals comprise radio frequency signals.

10. The circuit of claim 1, wherein the electrical signals comprise baseband signals.

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11. A fully differential amplifier circuit comprising:

a first operational amplifier having a first non-inverting input terminal, a first inverting input terminal and a first output terminal, wherein the first output terminal is coupled with the first inverting input terminal via a first resistor of a first resistance value;

a second operational amplifier having a second non-inverting input terminal, a second inverting input terminal and a second output terminal, wherein the second output terminal is coupled with the second inverting input terminal via a second resistor of substantially the first resistance value, and the first and second inverting inputs are coupled via a third resistor and a fourth resistor coupled in series, the third and fourth resistors both being of a substantially same second resistance value; and

a direct current (DC) source having a current output terminal coupled with, and between the third and fourth resistors, the DC source providing a direct current for shifting a common-mode voltage of one or more electrical signals processed by the fully differential operational amplifier.

12. The amplifier circuit of claim 11, wherein the DC source comprises a plurality of individual DC sources coupled electrically in parallel.

13. The amplifier circuit of claim 12, wherein the plurality of individual DC sources comprises a plurality of DC sources that generate approximately equivalent direct currents.

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14. The amplifier circuit of claim 12, wherein the plurality of individual DC sources comprises a plurality of DC sources that generate weighted direct currents.

15. The amplifier circuit of claim 12, wherein each of the plurality of individual DC sources is independently selectable.

16. The amplifier circuit of claim 15, further comprising a control bus for selectively coupling one or more of the individual DC sources with the third and fourth resistors.

17. The amplifier circuit of claim 11, wherein the DC source comprises a band-gap voltage referenced current source.

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18. The amplifier circuit of claim 11, wherein the band-gap voltage referenced current source comprises:

a band-gap voltage source;

an operational amplifier having a non-inverting input terminal coupled with the voltage source;

a substantially temperature independent precision resistor coupled with an inverting input terminal of the operational amplifier and an electrical ground;

a transconducting device coupled with an output terminal of the operational amplifier and the precision resistor; and

a current mirror circuit coupled with the transconducting device, wherein an output terminal of the current mirror circuit is coupled with the fully differential amplifier.

19. The amplifier circuit of claim 18, wherein the transconducting device comprises a field effect transistor.

20. The amplifier circuit of claim 18, wherein the transconducting device comprises a bipolar junction transistor.

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21. A method of shifting a common-mode voltage comprising:

applying a first differential signal to a first non-inverting input of a differential amplifier;

applying a second differential signal to a second non-inverting input of a differential amplifier, wherein the first and second differential signals have a first common-mode voltage;

generating a substantially fixed direct current;

communicating the substantially fixed direct current to the first and second inverting inputs of the differential amplifier in substantially fixed proportions;

producing first and second differential output signals having a second common-mode voltage, wherein the second common-mode voltage differs from the first common-mode voltage by a voltage amount proportional to the substantially fixed direct current.

22. The method of claim 21, wherein generating the substantially fixed current comprises:

applying a band-gap voltage to an amplifier;

applying an output signal of the amplifier to a first semiconductor device coupled with a precision resistor to generate a reference current in a second semiconductor device; and

mirroring the reference current with a third semiconductor device to produce the substantially fixed direct current.

23. The method of claim 22, wherein the first, second and third semiconductor devices comprise first, second and third bipolar-junction transistors (BJTs), the second and third BJTs have substantially the same physical dimensions and electrical characteristics.

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24. The method of claim 22, wherein the first, second and third semiconductor devices comprise first, second and third field-effect transistors (FETs), the second and third FETs have substantially the same physical dimensions and electrical characteristics.

25. The method of claim 21, wherein communicating the substantially fixed direct current to the first and second inverting inputs of the differential amplifier in substantially fixed proportions comprises communicating the substantially fixed direct current to the first and second inverting inputs via a resistor divider circuit including a first resistor and a second resistor, the first and second resistors having substantially the same resistance.

26. The method of claim 21, further comprising applying first and second feedback signals to the first and second inverting inputs by applying the first and second output signals, respectively, to the first and second inverting inputs via first and second resistors having substantially the same resistance.

27. The method of claim 21, wherein generating a substantially fixed direct current and communicating the substantially fixed direct current to the first and second inverting inputs of the differential amplifier comprises:

generating plural substantially fixed currents; and

communicating the plural substantially fixed currents to the first and second inverting inputs of the differential amplifier via a resistor divider.

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28. The method of claim 21, wherein generating the plural substantially fixed currents comprises generating the plural substantially fixed currents using plural direct current sources coupled electrically in parallel, and wherein communicating the plural substantially fixed current to the first and second inverting inputs of the differential amplifier in substantially fixed proportions comprises communicating the plural substantially fixed currents via a first resistor and a second resistor, the first and second resistors having substantially the same resistance.

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